How to host and deliver your training in a FAIR way

Module 3 – FAIR Training Material by Design
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Learning outcomes

By the end of this session, you should be able to:

- **List** common e-learning platforms
- **Explain** what the SCORM format is
- **Describe** pros and cons of different Learning Management Systems, from a FAIR perspective
- **Create** a course page setup to host and deliver training
- **Describe** how to make your training material FAIR using only google drive

What do we mean by hosting and delivery?

Hosting of materials:

- G suite / Nextcloud
- Github
- Zenodo / Figshare

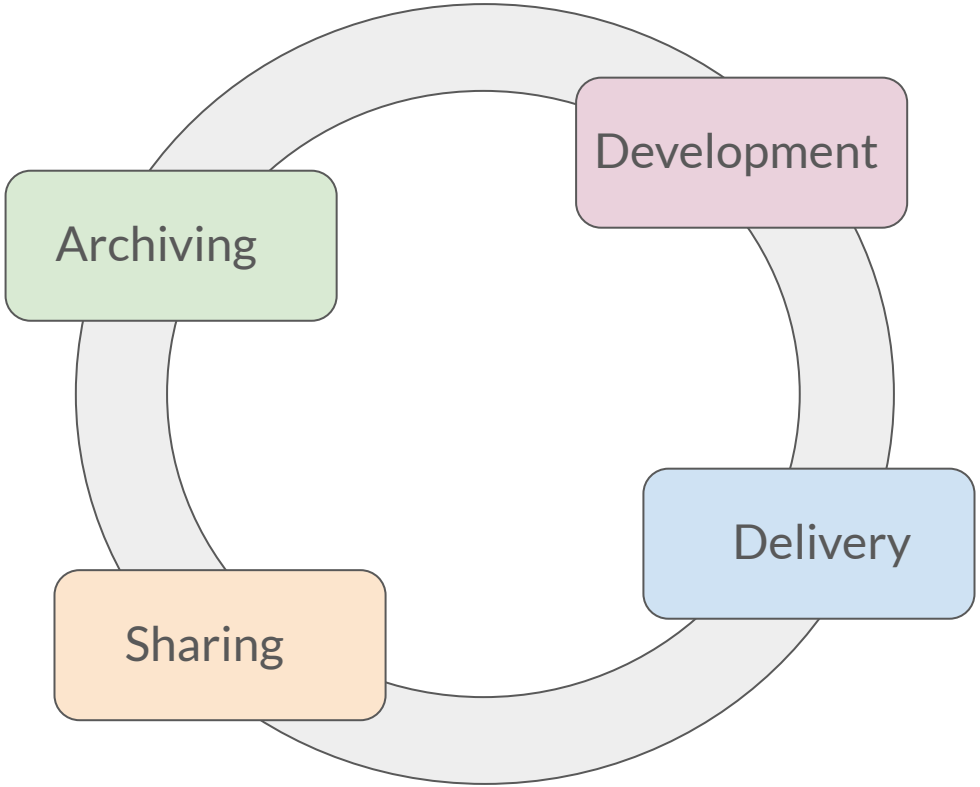
Image by svstudioart on Freepik

Delivery:

- LMS
- Github pages

Image by jcomp on Freepik

The 4 phases of training materials life cycle



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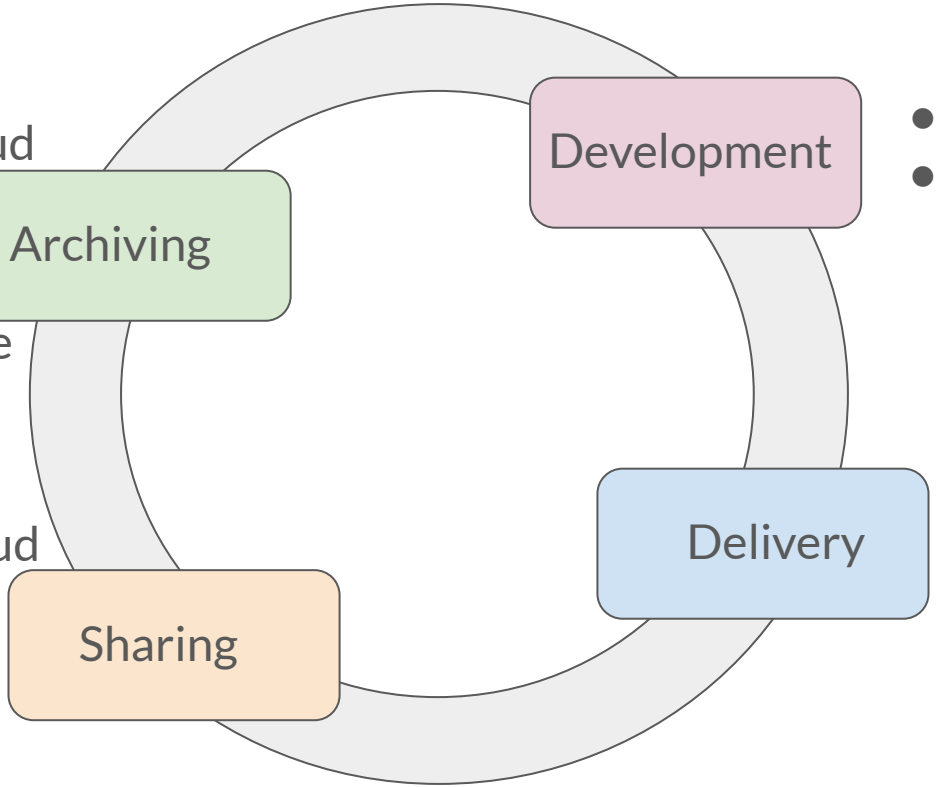


- G Suite / Nextcloud
- Github

- LMS
- Github pages

- G Suite / Nextcloud
- Github

G Suite + LMS

G Suite to develop the materials in a collaborative environment

Image by vectorjuice on Freepik

An LMS to deliver, share, and archive the training

G Suite

Collection of tools from Google

- Drive (for storing material)
  - Slides
  - Documents
  - Other data
- Email (for communication with students)

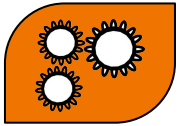
G Suite (google drive) / Nextcloud

FINDABLE

No global discovery (not indexed by search engines). Link required.

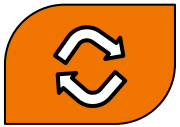
ACCESSIBLE

Access control can be regulated (individual sharing, public access, read/write permissions)



INTEROPERABLE

Supports common file types for viewing and editing: PDFs, google docs, microsoft office files. Possible for several persons to work in same collaborative document.



REUSABLE

Content can be duplicated, but only basic version control. Make sure to add README and other relevant information.

Learning management systems (LMS)

What is a Learning management system (LMS)?

- A platform to host and manage training materials, track student progress, and engage learners

Why use an LMS?

- Centralized platform
- Tracks learner progress and support learning

Image by vectorjuice on Freepik

Common LMSes

	Pros	Cons
Moodle - open source	• Customizable • Large community • Good for academic use	• Requires technical expertise
OpenEDX - open source	• Scalable • Global use • Supports rich content	• Requires technical support
Canvas - subscription	• User friendly • Robust integrations • Stable development	• Expensive • Limited customization
Google classroom - free/subscription	• Easy setup • Accessible	• Limited customization and advanced features • Costs extra for additional features

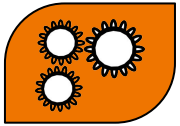
How an LMS makes your training FAIR

FINDABLE

LMSes often include metadata, search features, and indexing for easy retrieval.

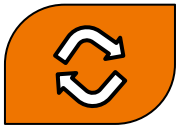
ACCESSIBLE

LMSes manage access controls, supporting open and restricted access as needed.



INTEROPERABLE

SCORM (Sharable Content Object Reference Model) enables interoperability across different platforms.



REUSABLE

Courses can be easily repurposed or adapted on most LMSes.

Standards for e-learning content

SCORM (Sharable Content Object Reference Model)
is a technical standard for packaging training materials to ensure interoperability across different e-learning systems.

xAPI
is a modern standard that allows tracking of diverse learning experiences both inside and outside the LMS.

CMI5
CMI5 combines the flexibility of xAPI with the structure of SCORM. It is designed for traditional LMS use cases but also extends to more modern, flexible learning environments.

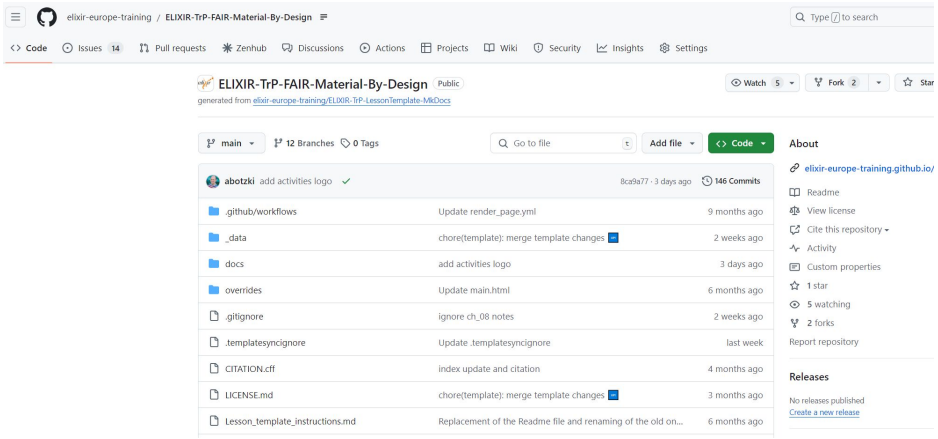
Standards for e-learning content

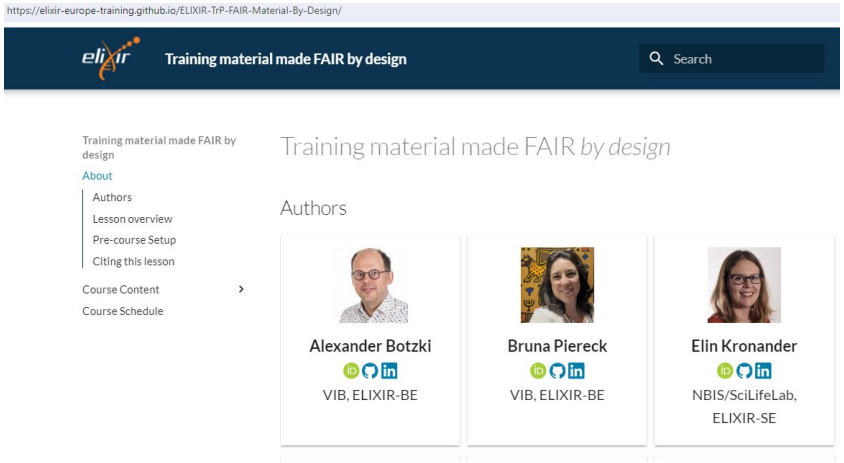
	SCORM	xAPI	CMI5
Moodle	Yes	Yes	Yes
OpenEDX	Yes	Yes	Yes
Canvas	Upload	A small piece	No
Google classroom	No	No	No

G Suite + LMS

1. Develop course syllabus + LOs in google drive
2. Make presentations using google slides
3. Set up a LMS (for example OpenEDX)
4. Either download presentations as pdfs and upload to OpenEDX, OR, integrate them directly from google drive using iframes
5. Make sure to link to the google drive folder with all materials (making it read-only)

Github + github pages





Develop, share, archive content on github

Deliver and share it through github pages

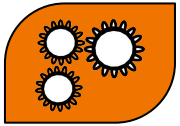
Github + github pages

FINDABLE

Indexed by search engines. Repositories can include detailed metadata.

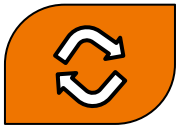
ACCESSIBLE

Repositories can be made public, providing open access, without giving away edit rights.
Github pages allows access for everyone as a simple website.



INTEROPERABLE

Supports multiple file formats: markdown, html, notebooks, etc.
Git allows for collaborations on the same repository, allowing several users
to develop content.



REUSABLE

Public repositories can be forked and reused as they are.
Releases or branches can be made to keep several course instances up and running.

Github + github pages

1. Create a github repository
2. Collaborate and create training materials in for example markdown
3. Use a framework for creating course page layout
    a. mkDocs
    b. Quarto
    c. Liascript
4. Set up a github page from your repo (not needed with Liascript)
5. Share the link to the website with your students

Other combinations

Google drive + LMS

Github + Github pages

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Github + LMS

Other combinations

Google drive + LMS

Github + Github pages

Google drive + Github pages

- Set up a simple github page with basic structure of course and syllabus
- Display course presentations, slides, videos on page, but hosted on google drive

Github + LMS

- Develop all your course material on github
- Use iframes or other renderers to display content in LMS

Discussion

	Findable	Accessible	Interoperable	Reusable
Google drive	No, not searchable			
Github + github pages		Yes, can be made public and accessible to all		
LMSes				Exported in SCORM format

RNAseq analysis course - case study

Kate has an onsite course in RNAseq analysis. She sends out all relevant course information by email to the students. During the course she has prepared powerpoint slides for her presentations, and exercise instructions that she has in a google drive folder she shares with her students. After the course is done, she sends the slides as pdfs to her students.

Findable	Not findable.
Accessible	Only for student on email list
Interoperable	No licence, not reusable
Reusable	Only pdfs.

Microscopy course - case study

Steve has a course in microscopy, delivered online. He also has a google drive folder where he prepares all his slides, exercises, and other relevant information regarding the course. This folder is read-only for anyone with the link. He sets up a course website in Canvas, where he links all information from his google drive, including presentation slides and exercises. The course website he makes public so everyone can see it. Plus, he links to the original google drive folder from Canvas.

Findable	Not findable, indexed
Accessible	Everyone can see the content. Access to google drive
Interoperable	Google is. No scorm format
Reusable	No licence, so maybe not

R course - case study

Jane has a hybrid course in R. She has set up a course website using github pages and Quarto. She has a github repo where she creates all information regarding the course, including slides and exercises using markdown. She uses releases to separate different instances of her course. All relevant information is published on the github page, with the links to the github repo.

Findable	
Accessible	
Interoperable	
Reusable	

Exercise - set up your course website

Based on the syllabus and learning outcomes from the previous session

Easy technical

No knowledge of github needed

Intermediate technical

Basic knowledge of github needed (clone, push, pull) + basic markdown skills

Advanced technical

Intermediate knowledge of github needed (clone, push, pull, gh-pages configuration) + basic quarto knowledge

Easy: OpenEDX

Intermediate: github with Liascript

Advanced: github with github pages